

REMARKS

This Amendment is submitted in response to the final Office Action mailed on January 9, 2009. A petition for a three month extension of time (\$1,110.00) and a Request for Continued Examination ("RCE") (\$810.00) are submitted herewith. The Director is authorized to charge \$1,110.00 for the three-month extension of time, \$810.00 for the RCE and any additional fees which may be required, or to credit any overpayment to Deposit Account No. 02-1818. If such a withdrawal is made, please indicate the Attorney Docket No. 117454-002 on the account statement.

Claims 8-19 are pending in this application. Claims 1-7 were previously canceled without prejudice or disclaimer, and Claim 13 was previously withdrawn from consideration. In the Office Action, Claims 8-12 and 14-19 are rejected under 35 U.S.C. §103. In response, Applicant has added new Claims 20-23. These claims do not add new matter. For at least the reasons set forth below, Applicant respectfully submits that the rejections should be withdrawn.

Applicant notes that Claims 10 and 14-18 have been amended solely for clarification purposes. These amendments do not add new matter. The amendments are supported in the Specification at, for example, Abstract; page 1, paragraphs 9 and 11; paragraph 14, lines 5-14; page 2, paragraph 20, lines 3-9; paragraph 25; page 3, paragraphs 31-35.

In the Office Action, Claims 8-9, 11-12, 14-15 and 17-19 are rejected under 35 U.S.C. §103(a) as being unpatentable over International Patent Publication No. WO/2002/035555 to Wakiya et al., whose United States equivalent is U.S. Patent Publication No. 2004/0109995 to Wakiya et al. ("Wakiya"). For at least the reasons set forth below, Applicant respectfully submits that *Wakiya* fails to disclose or suggest each and every element of Claims 8-9, 11-12, 14-15 and 17-19. Moreover, *Wakiya* teaches away from the present claims.

Independent Claim 8 recites, in part, an insulation coated conductive particle comprising a conductive particle having a surface that is coated with an insulating resin layer formed of an insulating resin having a carboxyl group, wherein the insulating resin layer is surface-treated with a polyfunctional aziridine compound. Similarly, independent Claim 14 recites, in part, an anisotropic conductive adhesive comprising an insulation coated conductive particle that is dispersed in an insulating adhesive, wherein the insulation coated conductive particle includes a conductive particle having a surface that is coated with an insulating resin layer formed of an insulating resin having a carboxyl group, and wherein the insulating resin layer is surface-treated with a polyfunctional aziridine compound.

Conventional conductive particles used in anisotropic conductive adhesives are coated with a thermoplastic insulating resin to prevent short circuiting between the conductive particles. See, Specification, page 1, paragraph 2, lines 1-6. However, the resin layer of such conductive particles swells, dissolves or is deformed in the solvents used to manufacture the anisotropic conductive adhesives. See, Specification, page 1, paragraph 5, lines 1-6. This adversely affects the conduction reliability of the anisotropic conductive adhesive. See, Specification, page 1, paragraph 5, lines 6-8. Therefore, the present claims provide a conductive particle which is coated with an insulating resin layer and further subjected to surface treatment with a polyfunctional aziridine compound. By forming the insulating resin layer on the surface of the conductive particle and then subjecting the insulating resin layer to a surface treatment with the polyfunctional aziridine compound, the surface of the insulating resin layer is crosslinked by the aziridine compound. See, Specification, page 2, paragraph 18, lines 1-20. This crosslinking increases the solvent resistance of the conductive particles, thereby improving the conduction reliability of the particles. See, Specification, page 1, paragraphs 10-12; page 2, paragraph 18, lines 20-23; page 4, paragraph 39. In contrast, *Wakiya* is deficient with respect to independent Claims 8 and 14 and Claims 9, 11-12, 15 and 17-19 that depend therefrom.

For example, *Wakiya* fails to disclose or suggest a conductive particle having a surface that is coated with an insulating resin layer, wherein the insulating resin layer is surface-treated with a polyfunctional aziridine compound as recited, in part, by independent Claims 8 and 14. The Patent Office asserts that *Wakiya* discloses a conductive particle that “is surface treated with a carboxyl containing resin that is treated with an aziridine based agent.” See, Office Action, page 2, lines 19-21. However, contrary to the Patent Office’s assertion, the only portion of *Wakiya* that discloses an aziridine compound teaches that monomers such as aziridine may be grafted directly onto the metal surface of the conductive particles, rather than onto the surface of an insulating resin layer. See, *Wakiya*, page 3, paragraph 32, lines 1-8. Although the monomer may be either aziridine or a compound containing a carboxyl group, see, *Wakiya*, page 3, paragraph 30, nowhere does *Wakiya* disclose coating the metal surface of its conductive particle with a carboxyl containing resin and further treating the resin layer with an aziridine compound. Instead, *Wakiya* is entirely directed to coated particles obtained by grafting a single organic compound onto a metal layer or a metal surface of conductive particles. See, *Wakiya*, page 1, paragraphs 5-7; paragraph 12; paragraph 14, lines 1-3; paragraph 15; page 2, paragraphs 22-23; page 3, paragraph 32. Even if the organic compound is obtained by graft polymerization of an

aziridine monomer unit, *Wakiya* specifically states that the monomer is grafted “onto the metal-surfaced particles,” rather than onto the surface of an insulating resin layer. See, *Wakiya*, page 3, paragraph 32, lines 1-8. In fact, *Wakiya* fails to disclose an insulating resin layer at all and instead teaches that such resin layers on the metal surface are undesirable because they may be easily peeled off when they are kneaded with a binder resin or an adhesive. See, *Wakiya*, page 1, paragraph 3, lines 25-32. As such, Applicant respectfully submits that *Wakiya* fails to disclose that an insulating resin layer is surface-treated with a polyfunctional aziridine compound as required, in part, by the present claims.

Moreover, one of ordinary skill in the art would have no reason to modify the conductive particle of *Wakiya* to obtain the claimed coated conductive particle because *Wakiya* teaches away from coating a metal surface of a conductive particle with a resin layer as required by the present claims. In determining the differences between the prior art and the claims, the question under 35 U.S.C. 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious. *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 218 USPQ 871 (Fed. Cir. 1983); *Schenck v. Nortron Corp.*, 713 F.2d 782, 218 USPQ 698 (Fed. Cir. 1983). In making this determination, prior art references must be considered as a whole, including portions that teach away from the claimed invention. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984); *Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve Inc.*, 796 F.2d 443 (Fed. Cir. 1986). “A prior art reference may be considered to teach away when a person of ordinary skill, upon reading the reference would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the Applicant.” *Monarch Knitting Machinery Corp. v. Fukuhara Industrial Trading Co., Ltd.*, 139 F.3d 1009 (Fed. Cir. 1998), quoting, *In re Gurley*, 27 F.3d 551 (Fed. Cir. 1994).

Wakiya is entirely directed to partially coated conductive particles obtained by partial modification of a metal surface or metal layer with a single organic compound capable of binding to the metal on the surface. See, *Wakiya*, page 1, paragraphs 5-7; paragraph 12; paragraph 14, lines 1-3; paragraph 15; page 2, paragraphs 22-23; page 3, paragraph 32. When discussing prior art coated particles having an insulating resin layer, *Wakiya* expressly teaches that:

Another drawback of the above methods is that since a resin is layered on the metal particle surface, the laminate resin may be peeled off also in the step of kneading the coated particles with a binder resin or an adhesive. Furthermore, the

resin may be peeled off from the coated particle surface even in the step of thermocompression bonding of the coated particle-containing anisotropic conductive film at elevated temperatures.

See, *Wakiya*, page 1, paragraph 3, lines 25-32. *Wakiya* further states that in such insulating resin layers, “the strength of bonding between the resin used for coating and the metal is weak, since the resin is only physically adsorbed on the metal-plated particles.” See, *Wakiya*, page 1, paragraph 3, lines 15-18. In contrast, *Wakiya* teaches that partial surface modification with its organic compound decreases the tendency for the particles to aggregate such that “the coating organic compound is hardly peeled off.” See, *Wakiya*, page 4, paragraph 43. One of ordinary skill in the art would understand that *Wakiya*’s repeated discussion of the “drawbacks” with insulating resin layers and the improved bonding using partial surface modification with an organic compound teaches away from a conductive particle with an insulating resin layer covering the metal surface of the particle in accordance with the present claims. Thus, Applicant respectfully submits that *Wakiya* teaches away from the claimed insulating resin layer.

Accordingly, Applicant respectfully requests that the rejection of Claims 8-9, 11-12, 14-15 and 17-19 under 35 U.S.C. §103(a) to *Wakiya* be withdrawn.

In the Office Action, Claims 10 and 16 are rejected under 35 U.S.C. §103(a) as being unpatentable over *Wakiya* in view of Japanese Patent Publication No. 08-325543 to Soken Chem. & Eng. Co. Ltd. (“*Soken Chem*”), Japanese Patent Publication No. 09-030112 to Mitsubishi Paper Mills Ltd. (“*Mitsubishi*”) or U.S. Patent No. 3,985,920 to Travis (“*Travis*”). Applicant respectfully submits that, even if combinable, the cited references are deficient with respect to Claims 10 and 16.

As discussed previously, *Wakiya* fails to disclose or suggest a conductive particle having a surface that is coated with an insulating resin layer, wherein the insulating resin layer is surface-treated with a polyfunctional aziridine compound as required, in part, by independent Claims 8 and 14 from which Claims 10 and 16 depend. The Patent Office relies on *Soken Chem*, *Mitsubishi* and *Travis* merely for the disclosure of specific aziridine compounds and using aziridine generally as a crosslinking agent. See, Office Action, page 3, lines 8-13. However, nowhere do *Soken Chem*, *Mitsubishi* or *Travis* disclose coating the surface of a conductive particle with an insulating resin layer and surface treating the resin layer with a polyfunctional aziridine compound, nor does the Patent Office cite support for such claimed element. Therefore, even if combinable, *Soken Chem*, *Mitsubishi* and *Travis* fail to remedy the deficiencies of *Wakiya* with respect to the present claims.

Accordingly, Applicant respectfully requests that the rejection of Claims 10 and 16 under 35 U.S.C. §103(a) to *Wakiya*, *Soken Chem*, *Mitsubishi* and *Travis* be withdrawn.

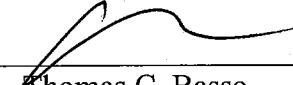
Applicant further notes that Claims 20-23 have been newly added. The new Claims are fully supported in the Specification at, for example, page 1, paragraphs 2-4 and 13; paragraph 16, lines 1-3; paragraph 17, lines 1-4; page 2, paragraph 18, lines 1-4; paragraph 20, lines 1-3; paragraph 24, lines 1-10; page 3, paragraphs 31-35; Japanese Patent Publication No. 05-217617 to Hitachi Chem. Co. Ltd.; Japanese Patent Publication No. 05-070750 to Fujitsu Ltd. No new matter has been added thereby. Applicant respectfully submits that the subject matter as defined in the newly added claims is patentable over the cited art for at least substantially the same reasons as discussed above.

Specifically, with respect to Claims 21 and 23, Applicant respectfully submits that the cited references fail to disclose an insulating resin layer that completely covers the surface of the conductive particle. As discussed previously, *Wakiya* is entirely directed to partially coated conductive particles obtained by partial surface modification of a metal surface or metal layer with a single organic compound. See, *Wakiya*, page 1, paragraphs 5-7; paragraph 12; paragraph 14, lines 1-3; paragraph 15; page 2, paragraphs 22-23; page 3, paragraph 32. *Wakiya* expressly teaches that “[b]y saying ‘partial surface modification with an organic compound’ herein, it is meant that the whole surface is not completely covered with that organic compound.” See, *Wakiya*, page 1, paragraph 11. Therefore, *Wakiya* fails to disclose an insulating resin layer which completely covers the metal surface of the conductive particles. The Patent Office relies on *Soken Chem*, *Mitsubishi* and *Travis* merely for the disclosure of specific aziridine compounds and using aziridine generally as a crosslinking agent. See, Office Action, page 3, lines 8-13. Nowhere do *Soken Chem*, *Mitsubishi* or *Travis* disclose coating the entire surface of a conductive particle with an insulating resin layer, nor does the Patent Office cite support for such claimed element. As such, the cited references fail to disclose or suggest a conductive particle, wherein the insulating resin layer completely covers the surface of the conductive particle as required, in part, by Claims 21 and 23.

For the foregoing reasons, Applicant respectfully submits that the present application is in condition for allowance and earnestly solicit reconsideration of same.

Respectfully submitted,

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